



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/521,779

01/21/2005

Yasuhiro Komiya

05046/LH

2530

1933 7590 12/05/2007
FRISHAUF, HOLTZ, GOODMAN & CHICK, PC
220 Fifth Avenue
16TH Floor
NEW YORK, NY 10001-7708

EXAMINER

THOMAS, MIA M

ART UNIT

PAPER NUMBER

2624

MAIL DATE

DELIVERY MODE

12/05/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/521,779

Applicant(s)

KOMIYA ET AL.

Examiner

Mia M. Thomas

Art Unit

2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 2 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Incomplete Office Action

1. In response to applicant's telephone inquiry on 30 November 2007, regarding the last Office action, the following corrective action is taken:

The period for reply of 2 MONTHS set in said Office Action is restarted to begin with the mailing date of this letter. The statutory reply period continues to run from the date of the previous Office Action.

2. A complete copy of the last Office Action is enclosed. A full office action with the missing statements at the end of page 10, beginning of page 11 is incorporated herewith. Copies of the references and other prior art that were previously supplied are not enclosed.

"Where an error in citation of a reference is brought to the attention of the Office by applicant, a letter correcting the error, together with a correct copy of the reference, is sent to applicant. See MPEP § 710.06."

MPEP 707.05(g)

Response to Amendment

3. This Office Action is responsive to the applicant's remarks received on 21 January 2005. Claims 1-16 remain pending. The specification has been amended to identify that this application is a U.S. National Phase Application under 35 USC 371 of International Application PCT/JP03/09381. The preliminary amendment has been accepted and entered for instant application 10/521,779.

Priority

4. Receipt is acknowledged of a certified copy of the Japanese application (2002-218864) referred to in the oath or declaration or in an application data sheet. If this copy is being filed to obtain the benefits of the foreign filing date under 35 U.S.C. 119(a)-(d), applicant should also file a claim for such priority as required by 35 U.S.C. 119(b). If the application being examined is an original application filed under 35 U.S.C. 111(a) (other than a design application) on or after November 29, 2000, the claim for priority must be presented during the pendency of the application, and within the later of four months from the actual filing date of the application or sixteen months from the filing date of the prior foreign application. See 37 CFR 1.55(a)(1)(i). If the application being examined has entered the national stage from an international application filed on or after November 29, 2000, after compliance with 35 U.S.C. 371, the claim for priority must be made during the pendency of the application and within the time limit set forth in the PCT and Regulations of the PCT. See 37 CFR 1.55(a)(1)(ii). Any claim for priority under 35 U.S.C. 119(a)-(d) or (f) or 365(a) or (b) not presented within the time period set forth in 37 CFR 1.55(a)(1) is considered to have been waived. If a claim for foreign priority is presented after the time period set forth in 37 CFR 1.55(a)(1), the claim may be accepted if the claim properly identifies the prior foreign application and is accompanied by a grantable petition to accept an unintentionally delayed claim for priority. See 37 CFR 1.55(c). Applicant is encouraged to claim the benefits of the foreign filing date in the specification.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2624

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-3, 5-9, 11,12,14,16 rejected under 35 U.S.C. 103(a) as being unpatentable over Elbaum et al. (US 6,201,880 B1) in combination with Zigelbaum (US 5,690,486).

Regarding Claim 1: Elbaum discloses an image processing system (Refer to Figure 1, numeral 10) comprising:

an image capturing unit (Refer to Figure 1, numeral 24);

and an image processing unit (Refer to Figure 1, numeral 26),

the image capturing unit comprising: an image pick-up optical system which picks-up an image of a subject (Refer to Figure 1, numeral 12; "The system 10 includes a source of illumination 11 which provides light to a hand piece 12 via an optical fiber or optical fiber bundle 14." at column 5, line 57);

an image pick-up device unit which obtains a subject signal from the subject (Refer to Figure 1, numeral 20);

and a photographing operating unit which performs an image photographing operation, the image capturing unit interlocking the plurality of illuminating light sources with an exposure timing of the image pick-up device unit (Refer to Figure 1, numeral 11), selectively lighting-on the plurality of illuminating light sources, and thus obtaining a plurality of subject spectroscopic images, and the image processing unit comprising: an image memory unit which stores the subject spectroscopic images photographed by the image pick-up unit (Refer to Figure 1, numeral 26a);

and the image processing unit calculates a desired image based on the image signal stored in the image memory unit ("In addition to providing graphic displays that aid in visualization, the

Art Unit: 2624

preferred embodiment of the present invention permits the operator to display on the monitor 28 one or more computer-calculated numerical measures of selected properties of the image which can assist the dentist in interpretation." at column 13, line 38).

Zigelbaum teaches a plurality of illuminating light sources with different characteristics of spectroscopic distributions (Refer to Figure 2, numerals 44-46).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add a plurality of illuminating light sources with different characteristics as taught by Zigelbaum with the a photographing operating unit which performs an image photographing operation, ...interlocking the plurality of illuminating light sources as disclosed by Elbaum because, the different characteristics of spectroscopic distributions will provide the user with a larger range of information to analyze the image. Additionally, "the device illuminates the tooth with light and detects the various color components of light reflected off the tooth." (Zigelbaum, abstract).

Regarding Claim 2: Elbaum discloses the image processing system according to claim 1, wherein the image processing unit further calculates, classifies, or analyzes a predetermined class of the subject based on the image signal stored in the image memory unit (Refer to Figure 1, numeral 26; "The digital processing unit, which can be a computer, also preferably compares a current image of a tooth to a previously taken image of the same tooth to identify changes in the tooth over time, by using some form of numerical correlation, for example." at column 3, line 49).

Art Unit: 2624

Regarding Claim 3: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit further comprises an illuminating detecting sensor ("A means for illuminating the tooth, such as an optical fiber coupled to an illumination source..." at column 4, line 1) which senses characteristics of spectroscopic distributions of ambient light, an external strobe light-emitting device is attachable to the image capturing unit (Refer to Figure 1, numeral 16), a sensing unit of the illuminating detecting sensor is optically connected to a light guide path of strobe light upon the external strobe light-emitting device is attached to the image capturing unit (Refer to Figure 1, numerals 22 and 23).

Regarding Claim 5: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit further comprises an optical member which reduces the illuminating unhomogeneity between the illuminating light source and the subject (Refer to Figure 1, numeral 14).

Regarding Claim 6: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit further comprises a connecting contact portion for interlocking with an external illuminating device, and the external illuminating device connected via the connecting contact portion is lit-on in the light-on sequence similar to that of the illuminating light sources (Refer to Figure 1, numeral 11, 14, 23 and 12).

Regarding Claim 7: Elbaum discloses the image processing system according to claim 1, wherein the plurality of illuminating light sources include at least one of a light source with the center wavelength of 780 to 900 nm or a light source with the center wavelength of 300 to 380 nm ("The filters may be provided on a filter wheel (not shown), for example. Four wavelength

Art Unit: 2624

bands are preferred, centered at 500 nm, 600 nm, 700 nm and white light." at column 6, line 45).

Regarding Claim 8: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit and the image processing unit are integrally formed (Refer to Figure 1, numerals 10).

Regarding Claim 9: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit includes a color chip for calibration in the image processing unit ("The imaging camera 514 was a Toshiba 1/2"570x high-resolution CCD (720x570 pixels), equipped with a 23-mm Schneider function/1.4 Xenoplan lens and an extender for reducing the field-of-view (FOV). The aperture and focus were adjustable. The image calibration scale was 43 pixels/mm over a 11.5-mm FOV." at column 7, line 7).

Regarding Claim 11: Elbaum discloses the image processing system according to claim 1, wherein the image processing unit comprises image filing software, and image data photographed upon operating the photographing operating unit is recorded to a predetermined portion of the image filing software (Refer to Figure 14, numeral 102; For example, "Overall image brightness may also be adjusted by the operator based on his observation of the image on the monitor. The operator can override the intensity set by the software, if desired." at column 12, line 5. Another example, "The image is analyzed by the computer software at step 102 to determine whether the maximum image intensity is within a predetermined range." at column 11, line 49).

Art Unit: 2624

Regarding Claim 12: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit further comprises subject portion sensing means which obtains positional information of the subject ("...the preferred embodiment of the present invention permits the operator to display on the monitor 28 one or more computer-calculated numerical measures of selected properties of the image which can assist the dentist in interpretation." at column 13, line 39).

Regarding Claim 14: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit further comprises a pulse rate measuring unit ("Conventional radiographs of the same 50 teeth were produced using GENDEX [TM] x-ray equipment, at 70 KVp, 7 ma, at 15 impulses, and recorded on Ektaspeed Plus [TM] film. The geometry was the same as that used in clinical practice in vivo." at column 14, line 57).

Regarding Claim 16: Elbaum discloses the image processing system according to claim 1, wherein the image capturing unit further comprises distance measuring means which manages the size of the subject in the photographed image ("...the preferred embodiment of the present invention permits the operator to display on the monitor 28 one or more computer-calculated numerical measures of selected properties of the image which can assist the dentist in interpretation." at column 13, line 39).

7. Claims 4 and 13 rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Elbaum (US 6,201,880 B1) and Zigelbaum (US 5,690,486) further in view of Vari (US 5,503,559).

Art Unit: 2624

Regarding Claim 4:

Elbaum discloses an image-capturing unit (Refer to Figure 1, numeral 24).

Zigelbaum discloses a plurality of illuminating light sources with different characteristics of spectroscopic distributions (Refer to Figure 2, numerals 44-46).

Elbaum in combination with Zigelbaum does not specifically disclose wherein the image-capturing unit further comprises reflected light rejecting means, which prevents the illuminating light source from being photographed to the subject.

Vari teaches wherein the image-capturing unit further comprises reflected light rejecting means, which prevents the illuminating light source from being photographed to the subject (Refer to Figure 14, numeral 66. "The dichroic filter rejects any excitation that may be included in the return light. The stop has a slit for allowing only a narrow ribbon of light to reach the grating. The grating separates the return light along an axis at a distance proportional to the wavelength of the return light." at column 3, line 20).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add together a reflected light rejecting means as taught by Vari with the image capturing unit as disclosed by the combination of Elbaum and Zigelbaum because "the excitation light induces the tissue within the root canal to fluoresce. The fluorescent light is collected by the optical fiber and transmitted back to a sensor that generates electrical signals indicative of the intensity of light within a predetermined wavelength band." (Vari, abstract). The combination of these elements can provide an instant detection of a tooth with the absence of light for stronger detection purposes.

Art Unit: 2624

Regarding Claim 13:

Elbaum discloses an image-capturing unit (Refer to Figure 1, numeral 24).

Zigelbaum discloses a plurality of illuminating light sources with different characteristics of spectroscopic distributions (Refer to Figure 2, numerals 44-46).

Elbaum in combination with Zigelbaum does not specifically disclose wherein the image-capturing unit further comprises a temperature measuring unit.

Vari teaches wherein the image-capturing unit further comprises a temperature measuring unit (Refer to Figure 3, numeral 50; "In another alternative embodiment, the sensor 50 may include a photodetector (PD) array having a built-in thermo-electric cooler (TEC). The TEC cooled array detector operates with lower noise levels than room temperature array detectors. A suitable TEC cooled array is the 1530-PUV thermoelectrically cooled CCD detector available from EG&G Princeton Applied Research of Princeton, N.J." at column 8, line 23).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add a temperature measuring unit as taught by Vari to the image capturing unit as disclosed by Elbaum because the photodetector array has a thermo electric cooler which operates with lower noise levels than room temperature and therefore as Princeton Applied Research Laboratories has concluded, it is more efficient to have a temperature measuring unit so that the photodetector will adapt to the optical fiber and excitation lighting that exists in the image capturing unit.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Elbaum (US 6,201,880 B1) in combination with Kunz (US 6,306,421 B1).

Art Unit: 2624

Regarding Claim 15:

Elbaum discloses an image-capturing unit (Refer to Figure 1, numeral 24).

Zigelbaum discloses a plurality of illuminating light sources with different characteristics of spectroscopic distributions (Refer to Figure 2, numerals 44-46).

Elbaum in combination with Zigelbaum does not specifically disclose wherein the image capturing unit further comprises an auscultation function.

Kunz teaches the image processing system according to claim 1, wherein the image capturing unit further comprises an auscultation function ("A similar study in dogs (Table 13), which collected data on food consumption, body weights, hematology parameters, clinical chemistry parameters, coagulation profiles, organ weights, clinical observations, thoracic cavity auscultation, ophthalmic examination, urinalysis, gross necropsy findings, and histopathology (high dose group), found that intravenous administration of cytochalasin B for seven consecutive days to beagle dogs at doses up to 648 .mu.g/kg/day (a cumulative dose of 4,536.mu.g/kg) did not result in any indication of adverse effects or toxicity." at column 73, line 16).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to add an auscultation function as taught by Kunz to the image capturing unit as disclosed by Elbaum because "this process of listening to sounds produced by movement of gas or liquid within the body as an aid to diagnosis with create a more efficient image capturing unit by allowing the unit to have various functions to analyze any given image.

Art Unit: 2624

9. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Elbaum (US 6,201,880 B1) and Zigelbaum (US 5,690,486) further in view of Irwin (US 7,144,248 B2).

Regarding Claim 10:

Elbaum discloses an image-capturing unit (Refer to Figure 1, numeral 24).

Zigelbaum discloses a plurality of illuminating light sources with different characteristics of spectroscopic distributions (Refer to Figure 2, numerals 44-46).

Elbaum in combination with Zigelbaum does not specifically disclose the image capturing unit us[ing] a portable terminal device having a photographing function and an illuminating light source unit having a plurality of illuminating light sources as one unit having different characteristics of spectroscopic distributions [that] is attachable to the portable terminal device having the photographing function.

Irwin teaches the image processing system wherein the image capturing unit uses a portable terminal device having a photographing function (Refer to Figure 3, numeral 1010), and an illuminating light source unit having a plurality of illuminating light sources as one unit having different characteristics of spectroscopic distributions (Refer to Figure 3, numeral 1012) is attachable to the portable terminal device having the photographing function (Refer to Figure 3, numeral 1026).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to use a portable terminal device having a photographing function with an illuminating light source unit that is attachable to the portable terminal device as taught by Irwin to the image capturing unit as disclosed by Elbaum because the portable device can also be attached to

Art Unit: 2624

other types of machinery (For example, "The chilled substrate 2210, for example, may be used in connection with a laser-based system 1010 such as depicted in FIG. 3 that contains a laser 1020, possible computer controlled, that is optically coupled to a hand piece 1030 via a flexible guide 1024." at column 23, line 37).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

2002/0102009	7,215,803
6,672,868	6,341,957
2005/0256383	6,276,933
5,051,823	

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mia M. Thomas whose telephone number is 571-270-1583. The examiner can normally be reached on Monday-Friday 8:30am-5pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2624

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Mia M Thomas
Examiner
Art Unit 2624

Mia M. Thomas



VIKKRAM BALI
PRIMARY EXAMINER